simulate texture, uphills/downhill, boundaries, or gravity, is translatable into a brake control. Thus a brake (not shown) in communication with the viewer input device **14** can change the way in which the viewer input device responds to the commands of the viewer. Thus the content data input device has a set of programmed commands such as the magnitude and/or timing of the brake response which are stored in the content data storage **16** for retrieval during the viewer's use of the system and method of the present invention. The magnitude and/or timing of the brake response is discussed in detail below.

While the content data is stored in the content data storage **16**, the prerecorded visual data is stored in a video data storage **17**. For example, frame sequences can be stored on a single laserdisc as separate disconnected sequences, like tracks on a music CD or chapters in a book. The prerecorded visual data can take any form such as digital or analog, the images be shot or animated, or can a combination of both, or the images can be stills as well. The content data and the prerecorded visual data are correlated and when replayed, are accessed by the processor **13** simultaneously so that they can be experienced by the viewer substantially simultaneously.

The viewer input device **14** may be a rotary device such as a knob, a "browsewheel," a crank or a trackball. The viewer input device may also be a mouse joystick or another suitable input device. When using a knob, browsewheel or crank, a rate-controlled "shuttle" control and position-controlled "jog" control can be used.

In the viewing mode of the present invention, the user views the prerecorded visual data on display **11**, the data being generated from data stored in the video data storage **17** and processed by processor **13**. While the viewer has control over the frame rate through viewer input device **14**, in accordance with the present invention, the processor **13** provides signals to the viewer input device to give the viewer a haptic sensation as the viewer advances through the frames in either the forward or backward directions.

The present invention is also applicable to digital data, stored on a laser disc or the like. Arrows **21** represent time codes or stamps, the number of which corresponds to the time in hours, minutes, and seconds of the footage. In one application, time codes are interpreted as edit points for use in editing. In accordance with the present invention, the time codes are used to correlate the video data with the content data. Film footage **19** is a prerecorded plurality of frames, distinguishable from generated images which are provided in real-time, such as computer generated images.

Between time codes, there may be several frames. For example, FIG. **3** is a blow up of a section **22** which contains four sequential frames **23**. These four frames represent landscape in a moviemap, where the footage was taken from a car as the car was moving in the forward direction down a road. The content data played in conjunction with the frames is created so that it is correlated to dips and bumps in the road that the footage has captured as the car advances. In that case, in advancing the frames by using the viewer input device, the viewer senses data simulating the texture of the ride in the car.

Frame **24***a* depicts a stop sign far off in the distance while frames **24***b* and **24***c* depict the car approaching the stop sign. Frame **24***d* depicts the car having reached the stop sign and braking to a stop. In providing feedback signals to the viewer input device based on the content of prerecorded image data, the present invention takes into account that it is preferable to provide the illusion of a mechanical stop. Therefore, the present invention provides the illusion of release without much "stickiness".

FIGS. **4** and **5** both depict the concept of the boundary constraint of a full brake stop. Turning to FIG. **4**, a crank arm **26** is depicted in communication with a ball or cylinder **27**. The ends of the horizontal line **28** represents boundary conditions where, for example, "MAX" is equivalent to the full brake stop in frame **24***d* and "0" is equivalent to the starting position of the car (not shown). In FIG. **5**, wall **31** depicts the brake zone. An arrow **32** shows the brake being applied to come to a full stop at the brake zone **31**. In a mechanical system, when an object hits the wall, it is stopped in only one direction and rebounds as shown by arrow **33**. However, it has been found that when a brake, such as in a haptic feedback system is applied for a full stop, there is no motion in the reverse direction because the brake is on, and therefore the system feels unnatural (sticky). It is preferable to create a sense of release or rebound after braking to best capture the feel of a mechanical system.

Turning to FIG. **6**, a braking system of the present invention may include a braking rotary shaft coupling device **36** which couples a hand control element **37** such as a crank handle or a browsewheel to a brake **38**. A shaft **39** is in communication with a highly accurate shaft encoder **41** such as an optical encoder to encode the shaft motion. For example, a shaft encoder providing 5,000 counts per revolutions is preferable. Turning the browsewheel **37** by hand changes the optical encoder output, which is translated by a processor **42** to simultaneously change the frame position of the video laserdisc player at box **43** and change the resistance of the variable brake. Changes in the resistance of the variable brake are dependent on the content of the video material stored on the laserdisc.

As mentioned above, it is preferable to capture the feel of a mechanical system in accordance with the present invention. In so doing, in one embodiment the rotary shaft coupling device **36** includes a flex coupling device **44** which is blown up in FIG. **7**. In this embodiment, the flex coupling provides a small amount of flexibility in the shaft. With sensors, particular types of motion which are caused by a change in the motion of the shaft rotation are detectable. A different embodiment is depicted in FIG. **8**, where the brake **39** is coupled to a chain link system **46** having a chain **47**. By providing the chain with a little slack **48**, a small change in the motion of the shaft is detectable. Accordingly, the feeling of a mechanical stop is effected because the system then induces a release when such conditions are sensed.

Alternatively, replacing the brake with a programmable motor provides active self-contained movement by the input device as well as variable resistance, i.e. it turns by itself. For example, the user input device moves on its own if the video material is of a car moving downhill. Such a replacement further enhances the feeling of tight coupling and control with the image content.

Turning to FIG. **9**, there is shown a memory **49** for applying different amounts of braking depending upon digital MAX and 0. That is, to induce variable brake values digital inputs are sent to the braking system. Such a circuit configuration is shown in FIG. **10** where in a DC circuit for applying voltage to the brake. Variable braking values are effected by turning "off" and "on" the voltage at different rates. As shown in FIG. **11**, by generating a signal having variable pulse-width-modulation, different brake values are possible. However, it has been found that by using a constant pulse, the brake has a tendency to resonate and provides an audible noise. That is the brake acts like a small EM speaker device.